MATH 395R (#3287) **Complex Variables for Scientists and Engineers**

Spring, 2010 Tuesday, Thursday 3:30-4:45 pm NAC 4/205

Book: *Complex Variables and Applications* , 8th Edition
by James Ward Brown and Ruel V. Churchill

Our intent is to cover the first six chapters plus selected topics from chapters seven and eight.

Chapter 1 - complex numbers	1 week.
Chapter 2 - analytic functions	2 weeks.
Chapter 3 - elementary functions	2 weeks.
Chapter 4 - integrals	2.5 weeks.
Chapter 5 - series	2.5 weeks.
Chapter 6 - residues and poles	2.5 weeks.
Chapters 7, 8 – applications	1.5 weeks.

Grading: There will be two (possibly three) in class tests and a final exam. The final counts 40 % of the grade. You should be warned that there are no makeups. Instead the remaining work will simply be counted more heavily. Some homework sets will be collected and graded for precision of explanation as well as for mathematical correctness. The cumulative results of the homeworks will be counted approximately 10 % of the grade.

Please attend regularly and be on time. You should take note of the College Policy on academic integrity. See
http://www1.ccny.cuny.edu/upload/academicintegrity.pdf

Office Hours: Tuesday and Thursday 2:30-3:30 pm
Other times by appointment.

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COURSE LEARNING OUTCOMES

DEPARTMENT: Mathematics

COURSE #: 39500 **COURSE TITLE: Complex Variables for Scientists and Engineers** CATEGORY: TERM OFFERED: Spring 2010 PRE-REQUISITES: 39100 PRE/CO-REQUISITES: HOURS/CREDITS: 3 hr., 3 cr. DATE EFFECTIVE:1/20/10 COURSE COORDINATOR: Akin	**CATALOG DESCRIPTION** Algebra and geometry of complex numbers; elementary transcendental and algebraic functions and their conformal mappings; Cauchy-Riemann equations, contour integrals, Cauchy Integral formula, analyticity and power series, the residue theorem and applications. **Text**: Brown and Churchill, *Complex Variables and Applications*, 8th Ed., McGraw-Hill

COURSE LEARNING OUTCOMES
Please describe below all learning outcomes of the course, and indicate the letter(s) of the corresponding Departmental Learning Outcome(s) (see list at bottom) in the column at right.

The student is expected to acquire the skills which are presented in the text and demonstrated by the instructor in class. These skills include the following, with associated departmental learning outcomes(see below):

1. Compute with and describe the geometric effect of elementary complex functions	a, b
2. Understand complex differentiation and apply the Cauchy-Riemann equations	e1, e2
3. Define complex line integrals and compute them for elementary functions	a, e1
4. State Cauchy's Integral Theorem and Integral formula and describe their connection and uses	a, e1, e2
6. Compute and analyze the properties of Taylor and Laurent series for complex functions	a, b, e1
7. Compute residues for complex functions and use them to compute contour integrals	a, b, e1

COURSE ASSESSMENT TOOLS
Please describe below all assessment tools that are used in the course.
You may also indicate the percentage that each assessment contributes to the final grade.

1. in class tests
2. homework sets
3. final exam

DEPARTMENTAL LEARNING OUTCOMES *(to be filled out by departmental mentor)*

The mathematics department, in its varied courses, aims to teach students to

a. perform numeric and symbolic computations
b. construct and apply symbolic and graphical representations of functions
c. model real-life problems mathematically
d use technology appropriately to analyze mathematical problems
e. state (e1) and apply (e2) mathematical definitions and theorems
f. prove fundamental theorems
g. construct and present (generally in writing, but, occasionally, orally) a rigorous mathematical argument.